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Mosquito News

Vol. 4, No. 1 MARCH, 1944

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MOSQUITO EGGS

Issued Quarterly By
EASTERN ASSN. OF MOSQUITO CONTROL WORKERS

INDIAN MOSQUITO PUMPS

for

MOSQUITO CONTROL WORKERS

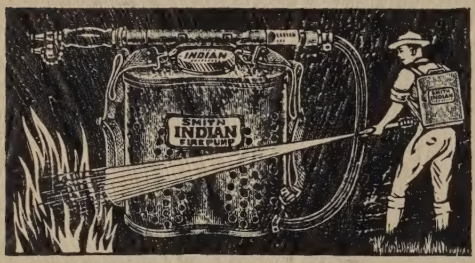


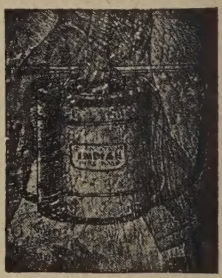
FIG. 1

Fig. 1. *SMITH INDIAN MOSQUITO PUMP*

is a 5-gallon galvanized tank equipped with double action pump and ADJUSTABLE NOZZLE. This outfit has a minimum of movable parts to wear or break. It is an ideal sprayer for both oil and pyrethrum larvicide spraying.

Fig. 2. Illustrates the ease in which the tank may be carried by hand, filled in the field and carried slung on the back, leaving the arms free to direct the spray or adjust the nozzle for long distant or fog mist.

The INDIAN MOSQUITO PUMP is highly endorsed for spraying for mosquito control work and many are in use for such purposes.



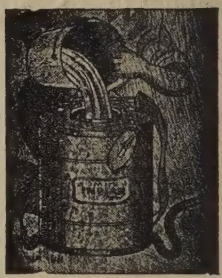


FIG. 2

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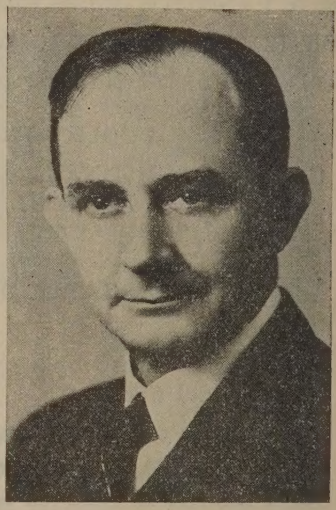
New Brunswick, New Jersey

Contributions to this magazine should be mailed to C. T. Williamson, Chairman of Publication Committee, Mosquito News, Yaphank, N. Y.

BIOGRAPHY

LOUIS L. WILLIAMS, JR., M.D.
Medical Director, United State Public Health Service



Louis L. Williams, Jr., was born in Hampton, Virginia, February 21, 1889. He received the degree of Doctor of Medicine from the University of Virginia in 1913, and served a year's internship in the Marine Hospital at Baltimore, Maryland.

Dr. Williams was appointed Acting Assistant Surgeon in the United States Public Health Service on May 27, 1914, and was put in charge of the Marine Hospital at Mobile, Alabama. The following April, he was commissioned Assistant Surgeon in the regular corps and assigned to duty on the United Sates Coast Guard cutter "Onondaga," serving as medical officer through June 1916. During the following three months, he combatted poliomyelitis in New York City, and then served for three weeks at the Immigration Station at Ellis Island.

He next put in a few months of study at the Hygienic Laboratory in Washington, D. C., the forerunner of the present National Institute of Health at Bethesda, Maryland, and then was detailed to the Marine Hospital in New Orleans, Louisiana to aid in making field investigations of malaria in the Southern States.

During World War I, Dr. Williams engaged in sanitation and malaria control activities in extra-cantonment areas in Kentucky, Mississippi, and Tennessee. The following year he served as malaria control officer for the extra-cantonment area at the Navy Yard and port terminals in Charleston, South Carolina, where he inaugurated a county health department.

From October 1919 to November 1921, he was assigned as liasion officer to the Massachusetts Department of Public Health, serving also as epidemiological aide and, for a few months, as District Health Officer in the Connecticut Valley District.

Between November 1921 and March 1927, Dr. Williams' assignment carried him into field investigations of malaria in Virginia, where he inaugurated several county health departments through which to develop rural malaria control methods. While there his studies of anopheline mosquito breeding in extensive areas overgrown with aquatic vegetation led him to secure the cooperation of Medical Officers of the Navy in distributing Paris green from an airplane, a method of control which proved successful in controlling the production of Anopheles quadrimaculatus in Quantico Bay and lower Chapawamsic swamp.

In March 1927, with the rank of Surgeon in the Service, he was put in charge of the Office of Malaria Investigations, with headquarters at Richmond, Virginia. (In 1930, this office was moved to Washington, D. C.) During the thirteen years he held this post, he directed studies of county-wide malaria control methods and aided the malaria control program in all of the Southern States. In 1939, he set up the health and sanitation division of the

(Continued on Page Thirty-four)

EDITORIAL SECTION

On March 15th at the Madison Hotel in Atlantic City, the three day convention of the New Jersey Mosquito Extermination Association will get under way. This is more than a New Jersey affair. It is attended by mosquito control experts from all over the United States and often from foreign shores. Subjects are discussed in which every mosquito worker should be interested and the proceedings of the Annual Meeting which are published after the meeting is concluded constitute another milestone in the advance of the science of exterminating mosquitoes.

This year as last year is a war year and it is expected that the main topics of discussion will be centered around the nation's war effort. The Public Health Service and the Medical Corps of the Army, Navy and Marines have encountered many unusual experiences. The wide area covered by these organizations make these new discoveries all the more exciting. Our armed forces are spread out all over the world and the health units carry on wherever the armed forces go. Of course, many of the new ideas evolving from the war effort are military secrets but there still should be much of interest brought forth in the next convention. This may be the last war time meeting of the association and it is expected and hoped by all those who attend that for this reason the meeting will be filled with intensely interesting items.

BUSINESS OF EASTERN ASSOCIATION

NEWS OF THE ASSOCIATION

Mosquito Extermination, once a subject of ridicule and amusement in the public press, has now taken the spotlight of public attention. Popular magazines, newspapers, trade and organization papers, all have seen how closely the control of the mosquito is linked with the successful prosecution of the war in areas where the mosquito-borne diseases occur. Valuable educational articles, for which publication was secured formerly only with considerable difficulty, now appear almost daily.

All of this means a public that is mosquito control conscious. We may look for even greater public interest in the post war period when men return home who have had malaria or have seen their comrades fall ill because of it, and when the thousands who have avoided this disease only because of the training or protective service furnished them in the armed forces are home to stay. These men are not going to stand idly by and allow mosquitoes to continue unabated. It thus appears that in the post war period we shall see great strides toward the ideal of a mosquito-free community.

Mindful of the widened scope of interest in mosquito work, the Eastern Association has caused to be prepared a new constitution which would permit ready nationalization of the organization if it is adopted. Certain advantages would obviously result from nationalization, and there are equally obvious disadvantages. It remains for the association as it is presently constituted to decide whether the advantages or the disadvantages are the greater. The constitutional committee has prepared a document which seems to fill the need if the Eastern Association is to become fully nationalized. The Executive Committee has directed that it be submitted to the membership for action at the meeting which is to be held at Atlantic City, N. J., on March 16, during the course of the meetings of New Jersey Mosquito Extermination Association.

At the same meeting, officers for 1944 will be elected, and plans made for the year's activities.

Thomas D. Mulhern
2/12/44

WORLD WIDE MOSQUITO CONTROL

THE SECOND DEADLY ENEMY

The Army, Navy and the Marines have two enemies to fight—one is the "axis" and the other is "malaria." Those charged with guiding the destinies of the armed forces are gradually bringing about the destruction of the armies of the first enemy while the Army and Navy Medical Corp backed by the United States Public Health Service are progressing toward conquering the dreaded malaria. Control of malaria is so important because much of the present war activity is taking place in malaria infected localities in foreign countries. This disease is also prevalent in many parts of our own country, particularly the south. There is no known preventative for malaria. Vaccines are available for defeating small pox and many other diseases but experiments to discover a vaccine for malaria have been stubbornly unsuccessful. All the authorities can do is to alleviate the disease once it is contracted. The most successful factor in the treatment of malaria is the use of quinine. When the Japs took over the East Indies the supply of this drug was almost totally cut off. However, just before the fall of Bataan, a United States plane was able to take off from that place with a large supply of seeds on board. These seeds have been planted in hot beds in this country and the shoots distributed to South American Countries where they are growing nicely so that we will soon have a limited supply of quinine.

Malaria is spread by the Anopheline mosquito. This mosquito transmits the disease by biting an infected person and carrying the germ to any others it may bite. When a victim succumbs to malaria he gets chills and fever and becomes too shaky to be of any fighting value. The best way to control malaria is to destroy the carrier mosquitoes, which have a limited flight range so the control problem is somewhat simplified around camps and settlements. However, the areas like the South Pacific, where most of the fighting is taking place in the jungle it is impossible to protect all the troops by this method. Reliance must be placed on nets and repellants. Anopheline mosquitoes breed in fresh water such as is found in large inland swamps and slow moving streams. In cities and villages it breeds in ornamental pools, and other containers that are left around uncovered or unscreened. The big carrier in North America is Anopheles quadrimaculatus. In 1940 there were, annually, 6,000,000 cases of malaria in the United States but this figure has probably been greatly reduced due to the extensive measures adopted in recent years.

Another carrier which has not yet entered the United States due to the vigilance of the Public Health Service is the Anopheles gambriae. This mosquito originated in Africa and was accidently introduced into Brazil by plane in 1930 resulting in a serious epidemic in that country which was only checked by the expenditure of $2,500,000 on the part of the Rockefeller Foundation and the Brazilian Government. In order to guard against this species of mosquito from entering this country all planes entering the United States are examined and sprayed. Passengers with malaria are permitted to land but must go to a hospital and stay there until they are cured.

When an invasion takes place in a malaria infected country especially trained malaria control units move in with the troops. These units direct spraying and drainage and the use of screens, nets, repellants and life saving medicines. Luckily there are spots in the Pacific entirely free from malaria where recuperation zones and hospitals have been established. Strict measures are taken to make sure that malaria carrying mosquitoes do not invade these zones. It is a well remembered fact that during the Spanish War more soldiers succumbed to malaria than Spanish bullets. The same condition exists in some localities in this war. Eighty-five percent of the men on Bataan were brought down by malaria and a large percentage of the men who have gone into the Pacific area have contracted the disease. Cases have also been invalided home from North Africa.

One of the latest inventions in the fight against malaria is what is known as a "mosquito bomb." This bomb contains a gas which will, when released,

kill every mosquito within 150,000 cubic feet in the course of twelve minutes inside a building or outside in still air. It is expected that this invention will be a great boon to civilians after the war. The malaria mosquito is essentially a night biter. In the day time the soldier in the swamps does not have much to fear but it is at night he becomes exposed. He who ignores the medicine, repellants and netting furnished is inviting serious sickness.

PROTRACT VS. PROTECTION

By O. W. Lafferty, Executive-Secretary
Cape May County Mosquito Extermination Commission

The editor of one of our leading newspapers during the early spring of 1943 stated that if county mosquito abaters could show him any proof that the methods of control actually retarded the mosquito menace within areas where work was executed and by submitting authentic proof of a creditable relief over one of annoyance, he would gladly endorse the projecting of sufficient funds (even though his area had to wait a couple of years for the work to reach his city) to start at a practical point of attack and continue the work until the entire areas were under control. I called his attention to successful reports dating up to about 1933, when our former abatement work was suffering for maintenance. He said he had lived through this period but did not think the records of that decade were up to date enough for him to get enthused. "Give us some outstanding feats within a couple of years and I will gladly re-support the cause."

We beg leave to submit the following testimonial of the medical department of the Naval Base at Cape May to substantiate our claim that control is possible. When this work was done, it was not with any thought of proving to this newspaper man that we desired to enter a contest. It was purely within our realm of control endeavors and a section in which for years we desired to try total elimination. So within the said testimonial, we feel the editor and you can find a mirror of success.

"U. S. NAVAL BASE
NAVAL ANNEX, ADMIRAL HOTEL
CAPE MAY, N. J.

USNB Dispensary 23 November, 1943

"Mr. O. W. Lafferty, Executive-Secretary
Cape May Co. Mosquito Exter. Commission
Cape May Court House, New Jersey
Dear Mr. Lafferty:

May I take this opportunity to thank your Commission for the wonderful mosquito abatement work you executed the summer of 1943. I can recall the horrible days and nights we encountered within our section in 1942 due to the pests, but your employees' diligence last season certainly not only won you the praise of the naval personnel and their families, but also that of the entire summer population.

The splendid work carried on by your entomological engineer, Albert Lafferty, in both 1942 and 1943 certainly credits your Commission with success. The joint scientific check and tabulation of your Engineer and the Staff of the Medical Department over a two year period, was not guess work; the number of adult mosquitos taken in our prevalence trap located within the court of our hospital showed an average nightly catch for 1942 of 129.5 adult mosquitoes and for 1943 of 9.9 adult mosquitoes. This marked decrease was accomplished by hard effort and capable work.

The project you so well performed, just east of our Base (on Two Mile Beach) and the many thousand feet of mosquito ditches and spraying that were taken care of on this Naval Base by our men under supervision of your Engineer, not only gave the Naval Base area comparative freedom from pests, but Wildwood and

Cape May's population found they did not have to "swat" as in former years.

I sincerely hope that your past cooperation will continue in the future. I shall look forward with gratitude to your help in 1944.

Very truly yours,
(Signed) S. SEGAL, Jr.
Commander MC-V (C) USNR
Senior Medical Officer."

HATS OFF TO THE BOYS BEHIND THE MICROSCOPE

By S/Sgt. Claude R. Strickland
29th Malaria Control Unit
Member Eng. Sec., American Public Health Association
Member Eastern Association of Mosquito Control Workers
V. President, Florida Anti-Mosquito Association

P.S. My 19th consecutive year in the field of Control.C.S.

It was my intention to serve the Ordnance Department thru'out this "Show" but Uncle Sam decreed otherwise.

We had added nothing to our knowledge of control but due to our bouncing around over Africa and our observations of things, places and locations of Camp Sites especially, we have come to appreciate a sister organization, "The Malaria Survey Unit."

Before proceeding, I must state that "I'm in the best Malaria Control Unit with the best Commander in the best Army in the world (soldiers like to brag)"

I dedicate the following article to the silent heroes who sit behind the microscope; that little band of scientists upon whose knowledge we are forced to depend for successful Malaria Control and it is the hope of this writer that the information given therein will serve the clarify the purpose and intent of The Malaria Survey Unit and to furnish inspirational stimulii thereto for the redoubling of its efforts in the reduction of work imposed upon Malaria Control Units:—

"HATS OFF TO THE BOYS BEHIND THE MICROSCOPE"

It is difficult for the mosquito control worker back home to visualize the movement of whole armies in a few hours (not days) the populations of which exceed that of many American cities. It is more difficult for him to picture the problems of housing and feeding these thousands, which, in themselves are staggering; But,—and added to these problems is that ever present threat of Malaria—that silent threat that has rendered whole armies impotent in a short, few days. Casual mention of these things may impress upon the reader that TIME is a most vital factor over here.

It isn't necessary to make comparisons between Army and Civilian methods of Malaria Control. Consult the best Public Health Service treatise on the subject and you have the Army Method first hand. The single exception is army discipline. This does not mean that the absence of vital control material does not often result in substitutions, it does.

Comment on control measures on the firing line ,out "where life and death hang poised in the scales that tip with a breath" must be reserved for future discussion. But, behind these areas, thousands upon thousands of Khaki Clad Youths are either stationed or "moving up." Selection of Camp Sites in these "behind the line areas" predetermines the success or failure of your Army Malaria Control Program. And, IF through expediency or lack of Malaria Information, someone stations troops in or near enough to reservoirs of infection—well—the story is tragic. Too, considering the tolerance (not immunity) developed through generations of infection and reinfection by native populations, it is impossible to blunder into success in the selection of Stations or Camps. In these selections, The Malaria Survey Unit MUST have a free hand lest the Control Unit inherits an impossible job. Remember,

Malaria can be controlled under any set of conditions with the exception of the factor TIME but don't forget, TIME is truly golden over here.

In consideration of the aforementioned and in appreciation for the sterling service rendered by these silent, Khaki Clad Scientists, lets say: Hats off—Boys Behind The Microscope, WE SALUTE YOU!

In conclusion, we quote an excerpt from a paper presented to the Florida Anti-Mosquito Association by this writer: "Mosquito Control is a problem in species, terrain and seasons; its solution is found in the fields of Entomology and Engineering." If plagarism is suspected in rendering this definition, the writer can only say 'others may have coined it but prior to its publication, he knew nothing of its existence.' This definition is applicable to every land and clime, contentions to the contrary are fallacious and wrong. Mosquito control workers know this and hence, do not get excited over "the different problem." As a finale, we also define Malaria in terms of Control: "Malaria is a problem in species, terrain and seasons, its solution is found in the fields of Parasitology, Entomology and Engineering."

The definitions herein given are as true in Africa as in America. The Parasitologist, Entomologist and Engineer have proven them to be so.

"ARE YOU WILLING TO TRY"
By S/Sgt. Claude R. Strickland
29th Malaria Control Unit

Permit me to digress from the usual "gab" of a fellow worker and write upon another subject, one that is "the topic of the day" or at least it should be.

Our pathway has crossed and recrossed a few outstanding spots upon the globe; our experiences have enriched our knoweldge of world affairs and peoples. The single, outstanding thing that impresses us most, and is encountered constantly, is the utter lack of even rudimentary sanitation. The second, and perhaps the greatest contribution to the first is POVERTY! Truly, we have seen wretched poverty at its worst where the earthly soil was the richest, yes, where a little science applied to their problems would raise thousands to a better standard of living and a better appreciation of HUMAN VALUES, GODLINESS and BEAUTY.

Preventive Medicine, Sanitation, Reservoirs of Disease—these mean nothing to millions of human beings. Romanticism seems to have drowned the better judgment of songwriters, poets and scribes who, for years, have painted a rosy picture of a grotesque scene. 'The scene is in contrast to the picture,' 'the song does not harmonize with the surroundings,' 'the written story fails to portray actuality!'

Problems of great magnitude will have to be solved when the "show" is over and they MUST BE SOLVED!! The world needs ENGINEERS as well as MISSIONARIES and the majority of its downtrodden people do not expect us to hand them something on a silver platter! To the travel minded engineer, great opportunities will be open to you and your pay will come from the meager earnings of millions for whom you work! The question is: "ARE YOU WILLING TO TRY?"

ACTIVITIES IN MEMBER STATES

MEETING OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES HELD OCTOBER 21-22-23, 1943 AT PHILADELPHIA, PA.

The 51st Annual Meeting of this Association was held at the Bellevue-Stratford Hotel, Philadelphia, October 21-22- and 23, 1943, and was attended by about 2,000 members of the Army, Navy, and United States Public Health Service personnel, active and retired, who were members of the Association. There were also present, as guests of the Association, the Surgeon General

or his representative from the following countries: Australia, Canada, China, Cuba, Czechoslovakia, Great Britain, Greece, Iran, Netherlands, Nicaragua, Norway, Peru, Uruguay, Venezuela and Yugoslavia.

Among the papers presented, which touched on the matter of Malaria and Mosquito Control, were papers on the subject of "Medical High-lights in Africa and Italy"—by Brigadier Hugh Morgan (MC) U.S.A.—Chief Consultant In Medicine, U. S. Army; "Medical High-lights in the Southwest Pacific"—by Brigadier General Charles Hillman, U. S. Army, Chief of Professional Service, U. S. Public Health Service; "U. S. Army Dietary Measures In Combatting Malaria" by Juan Iturbe, M.D. Caracas, Venezuela. One of the high-lights of the convention was a teaching panel on the subject of "Tropical Medicine", a large part of which was given over to the discussion of Malaria with particular reference to present conditions. Captain E. G. Hakansson acted as Chairman. His experience has been: "Research Work" Gorgas Memorial Laboratory, Panama, 1934-37; Pearl Harbor, U.S.S. Solace, December 7, 1941; Medical Officer in Command, Naval Medical Research Institute.

The Chairman opened the panel discussion with a ten minutes resume of the subject, following which written questions were collected from the audience which were handed to the Chairman who, in turn, designated one of the experts of this panel to answer the questions. The experts assisting the Chairman of the panel have, in the majority of cases, had practical experience at the front or are carrying on important clinical and laboratory investigations in this field of military medicine at leading medical centers of the nation. The experts constituting the panel included the following:

Commander Omar Brown
In charge of malaria control work and treatment of malaria patients in Panama; Directed Malaria Control Operations for Military Units in Cuba and Eastern Section of United States.

Dr. L. T. Coggeshall
Professor of Epidemiology and Tropical Medicine, School of Health, University of Michigan.

Lieutenant Colonel Thomas T. Mackie
Director, Division of Parasitology and Tropical Medicine, Army Medical Center. Executive Officer, Course in Tropical and Military Medicine, Army School, Army Medical Center.

Major Oliver R. McCoy
Consulting Parasitologist, Gorgas Memorial Laboratory, Panama, 1943; Chief of Division of Epidemiology and Tropical Diseases, Douglas Aircraft Co.

Dr. Henry E. Meleney
National Consultant, Malaria, Wartime Graduate Medical Meetings; Lecturer on Tropical Medicine, Army Medical School; Chairman of the Subcommittee on Tropical Diseases, National Research Council; President, American Society of Parasitologists.

Although some of the questions and answers are still considered matters of military secrecy, the general feeling at this meeting was that although malaria had accounted for many cases of illness requiring hospitalization, yet very good progress had been made in the prevention and control of this disease on the various battle fronts. During the earlier period on many fronts, malaria was the outstanding cause of hospitalization; but as the result of preventative measures combined with the knowledge of the physician, the entomologist and the sanitary engineer, considerable reduction has taken place in malaria.

The Malaria Control Units organized by the Army and Navy, in which several members of the Eastern Mosquito Control Association are serving, have done excellent work in preventing and controlling malaria, not only in the rear areas, but also well up toward the front lines.

The use of Atabrine as well as quinine has proven quite satisfactory; and the record, in fact, was very good considering the difficulties encountered in the various battle zones. Most of the malaria seems to be of the vivax type.

Two motion pictures—one called "Malaria Cause and Effect" issued by

the Army, and a Walt Disney animated cartoon on malaria called "Winged Scourge" issued by the U. S. Public Health Service, were shown at the meeting. There were also three excellent exhibits on malaria and mosquito control; one by the Army, one by the U. S. Public Health Service, and one by the Marine Corps—(which exhibit was prepared by Camp Lejeune, New River, N. C.)

BRIEF ACCOUNT OF THE JOINT MEETINGS OF THE AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS AND ENTOMOLOGICAL SOCIETY OF AMERICA

Prepared by Philip Granett, Assistant Entomologist, Rutgers University

Attendance at Meetings

The meetings were held at the Deschler-Wallick Hotel, Columbus, Ohio, December 7-9, 1943, and were well attended—250 to 300 pople being present.

Scope of Discussion

The meetings were divided into two parts; the first part dealt with Medical Entomology in wartime and the second part with Agricultural Entomology in wartime. The discussions on the whole tended to give a broad picture of the work being done by various agencies and individual groups in protecting the health of the soldier and civilian populations and in providing adequate insect control for agricultural crop pursuits.

Medical Entomology in Wartime

A copy of the printed program follows this account. Several additional papers were given in addition to discussion from the floor.

Instead of attempting to present a resume of each paper, some of the high lights and impressions left by the sessions, will be discussed here.

Malaria is recognized as the principal disease which the armed forces must combat. Mention was made of the effectiveness of the malaria survey and control units of the Sanitary Corps within the army camps and overseas and the control work performed in the neighborhood of camps in this country by the U. S. Public Health Service. The military units make most effective use not only of the customary control measures but also have adopted such recent developments as, improved larvicides, aerosols to kill adult mosquitoes in enclosed spaces and more effective repellents to prevent biting of mosquitoes in the field. It was interesting to note the common acceptance and apparent regard which the use of repellents has taken as one of the means of reducing the risk of contracting malaria. Although the malaria rate is admittedly high in some sections of the overseas war areas, the speakers intimated that all possible measures were being taken to control this disease.

Of great interest was the proposed plan, originated by Dr. L. L. Williams and advanced by Dr. Mountain at a recent conference on malaria, to eliminate malaria as an economic disease from the Americas. This plan, admittedly bold in its concept and scope, is proposed as a means of eliminating the danger of spreading the disease by infected troops returning from abroad. The plan is based on the principle that in any locality there is usually only one chief malarial vector. It is also known that a very small percentage of the possible vectors are infected. It is, therefore, proposed to reduce the principal malaria vectors to a low enough number to make the odds too long for transmission of the disease and thus reduce malaria to a point where it is not economically important. Pest mosquito control or control of non-Anopheles mosquitoes under this program will only be incidental to the main problem of malaria elimination. **Anopheles quadrimaculatus, Anopheles freeborni** in the United States and **Anopheles albimanus** in Central America region are considered the chief malaria vectors for these areas.

In addition to malaria other diseases carried by mosquitoes and other pests were mentioned and discussed. Of the mosquito borne diseases yellow fever, filariasis, and dengue are predominant. Mention was also made of the other pest carried diseases such as typhus, trench fever, plague, dysentery and leishmaniasis.

The use and development of apparatus to handle methyl bromide was discussed as an outstanding advance over World War I method of lice disinfestation of barracks bags and troops' equipment. Methyl bromide has been found highly effective for this purpose under all sorts of conditions. Coupled with the use of methyl bromide is a personal issue of a powder to kill lice. The powder is dusted into the clothing by the soldier when fumigation cannot be resorted to. The lice powder originally consisted of pyrethrins, synergist, anti, oxidant, ovicide, and carrier. It is understood that recent developments have substituted a new powerful insecticide, known as DDT, as the toxic ingredient in this lice powder.

T. C. Allen of Wisconsin presented a paper on use of an insecticide of vegetable origin, Sabadilla, as a toxic ingredient in fly sprays. Although reference to Sabadilla can be found in entomological literature, Allen claims that a four fold increase in toxicity can be otained by extracting the seed at 150°C. with kerosene as compared to a kerosene extract at room temperature.

Throughout the session there was continual reference to the high degree of cooperation existing between the U. S. D. A., particularly the Bureau of Entomology and such agencies as the Surgeon Generals Office, U. S. Public Health Service, Sanitary Corps and State Experiment Stations.

Agricultural Entomology in Wartime

Although the interest of the majority of the readers of this account lies mainly in the topics discussed in the Medical Entomology section, a few words will be given here on Agricultural Sessions.

Of the many chemicals tried by the Bureau of Entomology and Plant Quarantine as possible insecticides, the chemical DDT (Dichlorodiphenyl Trichloroethane) was outstanding. Other materials have been found as toxic for specific pests or groups of pests but DDT seemed to be best for a wide range of insects and from over-all considerations. Considerable work has been done with it although none of the details have been released as yet. The Bureau hopes to publish a resume of this work in the February Journal of the American Association of Economic Entomologists.

Another new "find" is said to be a mixture of dichlorpropylene and dichlorpropane, known as "DD" used as a soil fumigant.

In general it is hoped that the supply of insecticides during the coming year will be about the same as during 1943 or perhaps a little better. There was some indication that there would be a greater proportion of material released in small packages for the small crop producer. An estimate was presented indicating that Victory gardeners had produced over a billion dollars worth of vegetables and fruits. In towns and cities they had produced 17% of the total vegetables consumed.

ANTI-MOSQUITO GROUP FORMED
Ten Counties Represented at Session

The Florida East Coast Mosquito and Sand Fly Control Association was organized at a meeting here today of representatives of 10 counties along the East Coast from St. Augustine to Miami.

The group was set up to plan a co-ordinated attack on mosquito and sand fly problems.

Garnett Grant of Vero Beach was elected temporary president, and E. G. Thatcher was named secretary-treasurer. Each county will be represented in the association by two delegates. These were designated as follows:

Dade County, M. P. Lowery and Fred H. Stutz; Broward County, Ella Jo Stolberg and another to be designated; Palm Beach County, delegates to be named later; Martin County, Valentine C. Bartlett and John Michaelson; St. Lucie County, E. L. Taylor and Norman Platts; Indian River County, Garnett Grant and W. D. Cox; Volusia County, Elmer H. Blank and V. S. Minnich.

Delegates from Brevard, St. Johns and Flagler Counties will be named later. Steps will be taken immediately to fill the vacancies in the list of dele-

gates and a full executive committee will be appointed to prepare a platform and program of operations.

Elimination of mosquitoes and sand flies is the biggest problem facing the East Coast of Florida today, spokesmen declared. Possible co-operation of the Federal Works Agency, the Florida Inland Navigation District, the Florida State Board of Health, the United States Public Health Service and other agencies was discussed at the meeting.

DEVELOPMENTS IN MOSQUITO CONTROL

OIL FLOWS THROUGH 531-MILE SECTION OF GIANT PIPELINE 200 DAYS AFTER START OF CONSTRUCTION WORK

Completed Project Will Carry Crude Oil from Texas to Atlantic Coast—Will Be World's Largest Installation of Its Kind

From The Hercules Record, St. Louis, Missouri

Among the many big jobs of today, the 1,250 mile long pipeline from the Texas oil fields to the refineries on the Atlantic seaboard is one of the most spectacular.

On August 1st, 1942 seven experienced pipeline contractors began work on the 530 mile section of this project which runs from the oil fields in north-

Somewhere along the route of the world's biggest oil line. This shows pipe on skids ready to be lowered into position.

eastern Texas to a terminus in southern Illinois. Two hundred days later, or on February 20th, 1943, Texas crude oil had reached the Illinois terminal, from which point it was forwarded by railroad tank cars to the East.

The design and supervision of this pipeline is being carried out by the

Here is shown some of the equipment used by the George C. Bolz Dredging Company in laying the 24 inch pipe under the Mississippi River. This work is a part of a pipe line project that will carry crude oil from Texas to the Atlantic Seaboard.

War Emergency Pipeline, Inc., which was organized and is owned by eleven large oil companies who serve the Atlantic seaboard. As previously stated, the Texas-Illinois section of this project was let to seven well known pipeline contractors, as follows:

Anderson Brothers, Little Rock, Arkansas.
O. E. Dempsey Construction Company, Tulsa, Okla.
Charles S. Foreman Company, Kansas City, Mo.
Midwest Engineering & Construction Co., Tulsa, Okla.
Williams Brothers Corporation, Tulsa, Okla.
Oklahoma Contracting Company, Dallas, Texas.
Ray L. Smith Const. Co., Eldorado, Kan.

These contractors working simultaneously at different points, laid pipe at a rate averaging about six miles a day. In addition, an exceptionally interesting part of this project was done by the George C. Bolz Dredging Company of St. Louis. Their job was to lay the pipe across the Mississippi River. Most of the accompanying illustrations show their work.

All of the pipe on this project is of 24 inch diameter with a ⅜ inch thickness. The sections average from 38 feet to 44 feet in length, and weigh from 3,800 to 4,200 pounds. Within the completed section are eleven pumping stations. Eight major river crossings were involved.

Oil was pumped into this pipeline in Texas on the night of December 31st, 1942. It reached the storage tanks at the Illinois terminus on February 13th, 1943, at the rate of about 50,000 barrels a day. The maximum capacity of the line is 300,000 barrels a day. In the line, at all times, will be 1,525,000 barrels of crude oil.

This is another of the many vital war projects on which Hercules (Red-Strand) Wire Rope is taking an important part, as it was used by a majority of the original seven contractors.

On October 28th, 1942, the W.P.B. authorized the extension of this pipeline to an eastern terminus in Pennsylvania, and work on this extension is now under way. The total cost of the project is estimated to be $95,000,000.00.

QUININE STATUS OF ALLIES EASED
Guatemala Plantation Offsets Dutch Indies' Loss

Cinchona trees at El Porvenir, a 17,000-acre plantation on the slopes of an extinct volcano in Western Guatemala, provide a fresh source of quinine for the United Nations.

It would be a dream come true for President Justo Rufina Barrios if he were alive today. He started the plantation some sixty years back in an effort to develop and diversify his country's economy.

But the Dutch in the East Indies grew cinchona more cheaply than President Barrios could, and El Porvenir—which means "the future"—grew rank and untended. The cinchona trees were being used for firewood and fence-posts.

Then Japan captured the world's supply of quinine in the Dutch East Indies. Cinchona production for quinine became of great importance again in Latin America, where it originated.

El Porvenir is the largest single concentrated source of quinine known in the Western Hemisphere. Aerial surveys indicate that it has enough cinchona trees to provide an estimated 25 per cent of our supply of quinine for the next few years. After that, other Latin American areas may catch up.

The Gualemalan source is particularly handy because the bark can be shipped overland to the United States for processing.

Contracts have been signed through the Board of Economic Warfare with the Guatemalan Government whereby the entire output becomes available to the United States.

In addition to furnishing quinine, this plantation will provide sufficient seeds for the rest of this hemisphere, it is stated. A laboratory beng established there will carry on experimental work in creating higher-producing

hybrid strains of cinchora and will train experts in quinine production.

El Porvenir lies about 4,000 feet above the sea, with the heights of the extinct volcano, Tajmulco, Guatemala's highest mountain, towering another 10,000 feet above it. The plantation is only six miles off the new Pan-American highway.

With thousands of troops fighting in tropical areas where malaria is a constant threat, the needs for quinine are extensive.

STUDIES ON THE COMPARATIVE ATTRACTIVENESS OF 25-, 50- AND 100-WATT BULBS FOR PUERTO RICAN ANOPHELES.

Harry D. Pratt, P.A. Sanitarian (R)
U. S. Public Health Service
Office of Malaria Control in War Areas

Although it often has been observed that more anophelines are attracted to light traps equipped with bulbs of greater light intensities than is the case when the standard 25-watt bulb is used, there seems to be no supporting experimental data on record. During the Fall of 1943 the writer operated three New Jersey type light traps with 25-, 50- and 100-watt bulbs simultaneously near Cucharillas swamp in Catano, Puerto Rico. These traps were approximately 150 feet apart and the bulbs were interchanged at intervals of 3 to 5 days to minimize the effect of location of any particular trap on the experiment. Mosquito collection data for ten nights, when all three traps appeared to be working properly, are given in Table I.

These data suggest that anophelines are attracted to light traps in numbers which are roughly proportional to the wattage of the bulb used. A comparison of the total numbers of female **Anopheles** (the numbers of males taken were not large enough to be significant) shows that the traps operated with 50-watt and 100-watt bulbs collected 2.6 and 4.0 times as many **A. albimanus** Wiedemann respectively as did the trap having a 25-watt bulb. Similarly the collections of female **A. vestitipennis** Dyer and Knab show that the traps with 50-watt and 100-watt bulbs collected 2.7 and 4.8 times as many females respectively as did the trap having a 25-watt bulb.

In the case of **A. grabhamii** Theobald the increase in the number of females collected at increased light intensities was not so marked. Although the trap equipped with a 50-watt bulb collected 1.8 times as many females as did the trap with the 25-watt bulb, the one having a 100-watt bulb collected only 1.9 times as many.

CONCLUSIONS: Although there was considerable variation on individual nights, in general these seems to be a definite tendency for traps with lights of 25, 50 and 100-watt intensities to attract females of **Anopheles albimanus** and **A. vestitipennis** in numbers which are approximately proportional to the wattage of the light bulb. In the case of **A. grabhamii** approximately twice as many females were collected with a trap equipped with a 50-watt bulb as with one having a 25-watt bulb, but greater numbers were not taken when a 100-watt bulb was used.

Table I.

VARIATIONS IN COLLECTIONS OF ANOPHELINE MOSQUITOES IN CATANO, PUERTO RICO, MADE WITH LIGHT TRAPS USING BULBS OF 25, 50, AND 100-WATTS.

Date	A. albimanus						A. grabhamii						A. vestitipennis					
	Male			Female			Male			Female			Male			Female		
	25w	50w	100w	25w	50w	100w	25w	50w	100w	25w	50w	100w	25w	50w	100w	25w	50w	100w
Oct. 24	0	1	1	6	24	84	0	0	2	2	8	7	1	1	2	6	6	26
Oct. 25	0	0	0	0	20	23	1	0	0	12	26	11	2	9	9	3	22	44
Oct. 26	0	0	1	2	20	22	0	1	2	9	21	14	7	10	11	3	14	41
Oct. 27	0	0	0	2	11	33	2	1	0	10	17	34	0	4	3	7	18	31
Oct. 28	0	0	0	7	6	16	0	0	0	13	23	22	0	2	5	5	28	31
Oct. 29	0	0	0	5	3	5	1	0	0	13	16	17	0	3	4	15	24	38
Oct. 30	0	1	0	6	1	10	0	0	0	9	8	15	1	8	4	4	20	23
Oct. 31	1	0	1	7	3	9	0	1	0	6	11	15	2	10	8	11	6	14
Nov. 4	1	1	1	7	19	4	0	0	0	10	17	12	1	1	3	0	4	4
Nov. 5	1	0	2	14	40	21	0	2	3	2	5	13	0	0	2	0	4	5
Totals	3	3	6	56	147	227	4	5	7	86	152	160	14	48	51	54	146	257

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PERSONAL NOTES

Extract of a letter from Lt. J. G. Ransford Hemmings U. S. Naval Reserve formerly with the Nassau County Mosquito Extermination Commission. He was on duty in the Mediterranean Area but has recently returned to this country and is now located at Malaria Control Laboratory Hadnot Point, Camp Lejeune, New River, N. C.

"You wil no doubt be surprised to know of my being back in the States. I can't explain exactly without running the risk of giving out something restricted so I will just say it was decided our work there no longer required the same number of men and it appeared they could be used more effectively in another place.

Five officers and four men were relieved in October and brought back. Two officers and two men were left to maintain the work along with the Seabees assigned to malaria work at that station. Two of the officers were sent to Bethesda for instruction, one to an air station, while with my outfit I reported to this Marine Corps training base on December 1st after enjoying some leave at home. We have been told there were to be some men added to the team and that after they have had the necessary training here that we can expect to go out again. We are supposed to be in the States six months for a rest and so on but I have already landed in the hospital here with a heavy cold, while over in Africa I believe I was the only man in our division who did not miss a day's duty. The climate surely seemed to agree with me for I weighed 201 when I landed in New York.

We left our base in a large bomber on October 28th and flew south to a point on the west coast of Africa which I won't name. It was real jungle country, I will say, and the temperature was something hard to believe unless one had experienced it. Next day we flew across the Atlantic, crossing the Equator and landing at a point in Brazil. It was hot there too though not so uncomfortable as in the last place. We left there the next morning and flew along the Mahogany country till we came to the Amazon, landing in the southern mouth. Still hot. In fact this was almost under the Equator. Our stop that night was in Trinidad which I believe to be the most beautiful of all the places we saw. We left there the next morning and after stopping at San Juan, Puerto Rico, reached Bermuda that night. It was there I began to notice a slight cooling of the air. It was a little rough the next morning when we took off and grew cooler all the way to LaGuardia Field. It wasn't such a change as I expected however, somehow. I secured a place on a plane to Boston and was at my wife's home by three the next morning."

EASTERN ASSOCIATION OF MOSQUITO CONTROL WORKERS

New Brunswick, New Jersey

APPLICATION FOR MEMBERSHIP

Date Submitted .....

The purpose of this association is as follows: To promote closer cooperation among its members in the work of mosquito extermination; to attain higher standards of efficiency; to encourage further research; to disseminate information regarding mosquitoes and mosquito control; to work for recognition and cooperation among public officials to secure the enactment of legislation favorable to and leading toward a broader program of mosquito control work wherever it is needed; to combat unfavorable propaganda directed against mosquito work; to protect wildlife in the course of mosquito control work as far as is practicable; to work for a better understanding with related organizations, in order to bring the interests of all into closer agreement.

There are four class of membership:

1. **Active**—Open to any person engaged upon mosquito control work and any person whose line of professional duty includes work on mosquitoes. Only active members may hold office, or vote on matters of association business. Dues $4.00 per year including subscription to quarterly journel "Mosquito News."

2. **Associate**—Open to any person who has shown by past performance that he or she has been interested in mosquito control activities, or who may desire to become cooperative in furthering the work. Dues $2.50 per year, including subscription to quarterly journal "Mosquito News." Associate members may not hold office or cast a vote on association matters.

3. **Honorary**—Open to persons whose accomplishments in mosquito work have been such as to cause three-fourths of the active membership to feel that the association is honored by their inclusion. Candidates for honorary membership shall be proposed only by the Executive Committee.

4. **Institutional Subscription to "Mosquito News," $3.00.** Includes special institutional membership, entitling organization to receive copies of all information sent to general membership. This classification is intended primarily for libraries, research and educational institutions, etc.

All members shall receive at no cost copies of all notices, announcements, minutes of meetings, and publications.

Name of Candidate .....

Present Position
and Employer .....

Address .....

Class of Membership Desired .....

Signature of Member Sponsoring Application .....
Action of Membership Committee Date

SUPPLIERS DIRECTORY

Considerable time has been devoted to the preparation of the following list. The list is by no means complete and undoubtedly you will find names omitted which should have been included. The committee suggests to its members that when contacting suppliers or advertisers that credit be given "MOSQUITO NEWS". The success and growth of your magazine depends primarily on your support. The committee also assumes no responsibility for omissions in the listings. Any corrections, additions or information pertaining to this listing or future listings should be directed to James T. Hart, Jr., 3 Frankln Place, Morris Plains, New Jersey.

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Glendinning & Co., 1144 Fifth Ave., Los Angeles, Calif.
Hammill & Gillespie, 225 Broadway, New York City.
Illinois Minerals, 807½ Washington Ave., Cairo, Ill.
Innis, Speiden & Co., 117 Liberty St., New York City.
Penick, S. B. & Co., 132 Nassau St., New York City.
Salomen, L. A. & Bros., 216 Pearl St., New York City.
Starkie, A. E., Oak Park, Ill.
Tamms Silica Co., 228 No. LaSalle St., Chicago, Ill.
United Clay Mines Corp., Prospect & Oakland Sts., Trenton, N. J.
Whittaker, Clark & Daniels, 260 W. Broadway, New York City.
Wilson, T. C. Co., 503 Market St., San Francisco, Calif.

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Austin-Western Road Machine Co., Aurora, Ill.
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Consolidated Wagon & Machine Co., Salt Lake City, Utah.
Crane Co., 1225 I St., N. W., Washington, D. C.
Cummings Co., 194 Frelinghuysen Ave., Newark, N. J.
Dale & Rankin, Inc., 113 Frelinghuysen Ave., Newark, N. J.
Gray Concrete Pipe Co., Jefferson Davis Hwy., Arlington, Va.
Harnischfeger Corp., Milwaukee, Wisc.
Hayward, The Co., 50 Church St., New York, N. Y.
Johnson & Dealaman, Inc., 225 South St., Newark, N. J.
Killefer Mfg. Corp., Ltd. 5525 Dowhey Rd., Los Angeles, Calif.
Leschen & Son Rope Co., 90 West St., New York, N. Y.
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Loomis, C. H. & Co., 154 First St., New York, N. Y.
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Melvese, Geo., Jerico Trp., Mineola, L. I., N. Y.
New York Wire Cloth, 500 Fifth Ave., New York, N. Y.
Noland Co. Inc., 136 K St., N. E., Washington, D. C.
Owen Buckets, Cleveland, Ohio.
Penn, H. O. Machinery Co., Inc., 140th St., East River, New York, N. Y.
Roebling, John A. & Son Co., Trenton, N. J.
Ryerson Joseph T. & Co., Chicago, Ill.
Smith Tractor & Equipment Co., Irvington, N. J.
Stortz, John & Son, Inc., 210 Vine St., Philadelphia, Pa.

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SEACOAST LABORATORIES, INC., 156 PERRY ST., N. Y., N. Y.
American-British Chemical Supplies, 180 Madison Ave., New York City.
American Cynamid & Chemical Corp., 30 Rockefeller Plaza, N. Y. C.
Baird & McGuire, Inc., Holbrook, Mass.
Barrett Co., 40 Rector St., New York City.
Braun-Knecht-Heimann Co., 1400 16th St., Los Angeles, Calif.
California Spray-Chemical Corp., Richmond, Calif.
Chemical Supply Co., 2405 Canal Rd., Cleveland, Ohio.
Chicago Sanitary Products Co., 3100 So. Troop St., Chicago, Ill.
Cooper, Wm. & Nephews, 1909 Clifton Ave., Chicago, Ill.
Crowley Tar Products Co., 271 Madison Ave., New York City.
Crystal Soap & Chemical Co., Inc., 6300 State Rd., Tacony, Philadelphia.
Davies-Young Soap Co., Dayton, Ohio.
Dodge C. B. Co., Westport, Conn.
Eagle Soap Corp., Huntington, Ind.
Fuld Bros., 702 So. Wolfe St., Baltimore, Md.
Globe Sanitary Supply Co., 2249 E. 38th st., Los Angeles, Calif.
Good, James, Inc., 214 E. Susquehanna Ave., Philadelphia.
Hockwald Chemical Co., 135 Mississippi St., San Francisco, Calif.
Insecticide Corp. of America, Medina, N. Y.
Jordan, Wm. E. & Bros., 2590 Atlantic Ave., Brooklyn, N. Y.
Koppers Co., Tar & Chem. Div., Koppers Bldg. Pittsburgh, Pa.
Los Angeles Chemical Co., 1960 Santa Fe Ave., Los Angeles, Calif.
Mallinckrodt Chemical Works, 3600 No. Second St., St. Louis, Mo.
McKesson & Robbins, Inc., 200 So. Los Angeles St., Los Angeles, Calif.
McLaughlin Gormley King Co., 1715 Fifth St., S. E., Minneapolis, Minn.
Merck & Co., Inc., Rahway, N. J.
Monsanto Chemical Co., 1700 So. Second St., St. Louis, Mo.
Niagara Sprayer & Chemical Co., Inc., Middleport, N. Y.
Reilly Tar & Chemical Co., Indianapolis, Ind.
Republic Creosoting Co., Indianapolis, Ind.

Shell Oil Co., 100 Bush St., San Francisco, Calif.
Thompson Hayward Chemical Co., Des Moines, Iowa.
Trojan Products & Mfg. Co., 3107 So. Wabash Ave., Chicago, Ill.
White Tar Co. of N. J., Kearny, N. J.

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American Fork & Hoe Co., 1623 Euclid Ave., Cleveland, Ohio.
Ames, Baldwin, Wyoming Co., Parkersburg, W. Va.
Ames, Oliver & Sons, North Easton, Mass.
Hamlin Metal Products Co., 58 West Exchange, Akron, Ohio.
Ingersoll Steel & Disc, New Castle, Ind.
Iwan Bros., Inc., South Bend, Ind.
Magor Car Corp., 50 Church St., New York, N. Y.
Manahan, Julian D., 3510 Bergenline Ave., Union City, N. J.
Seashore Machine Works, Atlantic City, N. J.
Union Fork and Hoe Co., Columbus, Ohio.

DUST MIXERS

Ace Wood Products Co., 1891 W. 25th St., Cleveland, Ohio.
Agicide Laboratories, Inc., 4668 No. Teutonia Ave., Milwaukee, Wisc.
Day, The J. H. Co., 1144 Harrison Ave., Cincinnati, Ohio.
Frost Insectide Co., Arlington, Mass.
Niagara Sprayer & Chemical Co., Inc., Middleport, N. Y.
Peerless Dust Gun Co., 5100 St. Clair Ave., Cleveland, Ohio.

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BEAN, JOHN MFG. CO., LANSING, MICHIGAN (Out for duration).
SEACOAST LABORATORIES, INC., 156 PERRY ST., N. Y., N. Y.
SMITH, D. B. & CO., INC., UTICA, NEW YORK.
Agicide Laboratories, 4668 Teutonia Ave., Milwaukee, Wisc.
American Cyanamid & Chemical Corp., Rockefeller Pl., New York, N. Y.
"Friend" Mfg. Co., Gasport, N. Y.
Frost Insecticide Co., Arlington, Mass.
Liro, P. E., Inc., Vineland, N. J.
Master Fan Corp., 1321 Channing St., Los Angeles, Calif.
Messinger Mfg. Co., Tatamy, Pa.
Niagara Sprayer & Chemical Co., Inc., Middleport, N. Y.
Olson Bros., Kingsburg, Calif.
Roediger, Paul O., Princeton, N. J.
Root Manufacturing Co., 1051 Power Ave., Cleveland, Ohio.
Shunk Manufacturing Co., Bucyrus, Ohio.
Stauffer Chemical Co., Inc., 420 Lexington Ave., New York, N. Y.
Wilson, Andrew, Inc., Springfield, N. J.

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Brunning, Charles, Inc., 102 Reade St., New York, N. Y.
Dieterich-Post Co. 15 First St., San Francisco, Calif.
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Gurley, W. & L. E., Troy, N. Y.
Keuffel & Esser Co, Hoboken, N. J.
Lietz, A. & Co., 520 Montgomery St., San Francisco, Calif.
Pembroke Company, 22 E. 3rd St., Salt Lake City, Utah.
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Salt Lake Blue Print & Supply Co., Salt Lake City, Utah.
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Corning Glass Works, Corning, N. Y.
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Empire Laboratory Supply Co., Inc., 559 W. 132nd St., New York City.
Fauffman-Lattimer Co., The, 263 N. Front St., Columbus, Ohio.
Fisher Scientific Co., 709 Forbes St., Pittsburgh, Pa.
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General Machine Co., 398 Market St., Newark, N. J.
Green, F. R. & Co., Inc., 43 Exchange Pl., New York City.
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Heil Corp., 210 S. Fourth St., St. Louis, Mo.
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National Scientific Corp., 814 N. Franklin St., Chicago, Ill.
Ohio Chemical & Mfg. Co., 1177 Marquette St., N. E., Cleveland, Ohio.
Palo Company, 153 W. 23rd St., New York City.
Schaar & Co., 556 W. Jackson Blvd., Chicago, Ill.
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Taylor Instrument Companies, Rochester, N. Y.
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Columbia Soap & Chemical Co., 217 Clara St., San Francisco, Calif.
Crystal Soap & Chemical Co., 6300 State Rd., Tacony, Philadelphia, Pa.
Dairy Corp. of America, 221 No. LaSalle St., Chicago, Ill.
Dow Chemical Co., Midland, Mich.
duPont de Nemours Co., E. I., Wilmington, Del.
Los Angeles Soap Co., Los Angeles, Calif.
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DOGGETT-PFEIL CO., SPRINGFIELD, N. J.
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SEACOAST LABORATORIES, INC., 156 PERRY ST., N. Y., N. Y.
Baird & McGuire, Inc., Holbrook, Mass.
California Spray-Chemical Corp., Richmond, Calif.
Cary Mfg. Co., Joliet, Ill.
Chemical Supply Co., 2450 Canal Rd., Cleveland, Ohio.
Chicago Sanitary Products Co., 3100 S. Throop St., Chicago, Ill.
Clifton Chemical Co., 247 Front St., New York City.
Creco Co., Inc., reco Bldg., Long Island City, N. Y.
Crystal Soap & Chemical Co., 6300 State Rd., Tacony, Philadelphia, Pa.
Eagle Soap Corp., Huntington, Ind.
Hockwald Chemical Co., 30 Bluxome St., San Francisco, Calif.
Hysan Products Co., 2560 Armitage Ave., Chicago, Ill.
Marshall Products, Inc., 806 North First St., St. Louis, Mo.
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Merck & Co., Inc., Rahway, N. J.
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Pratt, B. G. Co., 50 Church St., New York City.
Sonneborn, L. & Sons, 88 Lexington Ave., New York City.
U. S. Sanitary Specialties Corp., 435 South Western Ave., Chicago, Ill.
White Tar Co. of N. J., Kearny, N. J.
Wilson, Andrew, Inc., Springfield, N. J.
Woods, Frank Z., 444 W. Grand Ave., Chicago, Ill.

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Alan-Clarke Co., 98 Chambers St., New York, N. Y.
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Budd, E. G., Mfg. Co., 25th and Huntington Park Ave., Philadelphia, Pa.
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Topping Bros., 159 Varick St., New York, N. Y.
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Denoyer-Geffert Co., 5235 Ravenwood Ave., Chicago, Ill.
Eimer & Amend, 18th St. & 3rd Ave., New York, N. Y.
Fischer Scientific Co., 709 Forbes St., Pittsburgh, Pa.
General Biological Supply House, Inc., 761 E. 69th Pl., Chicago, Ill.
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N. Y. Biological Supply Co., 34 Union Sq., New York, N. Y.
Spencer Lens Co., Buffalo, N. Y.
Standard Scientific Supply Corp., 34 W. 4th St., New York, N. Y.
Thomas, Arthur H., Washington Sq., Philadelphia, Pa.
Ward's Natural Science Establishment, Inc., P. O. Box 24, Rochester, N. Y.
Zeiss, Carl, Inc., 485 Fifth Ave., New York, N. Y.

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University of Utah, Salt Lake City, Utah.

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Red Feather Oil Co., Salt Lake City, Utah.
Sinclair Refining Co., 10 W. 51st, New York, N. Y.
Standard Oil Co. (N. J.), 26 Broadway, New York, N. Y.
Standard Oil Co. (Ind.), Chicago, Ill.
Sun Oil Co., 420 Lexington Ave., New York, N. Y.

Texas Co., The, 135 E. 42nd St., New York, N. Y.
Tidewater Oil Co., 17 Battery Pl., New York, N. Y.

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CHIPMAN CHEMICAL CO., INC., BOUND BROOK, N. J.
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Bartlett, N. M., Spray Works, Beamsville, Ont., Canada.
California Spray-Chemical Corp., Richmond, Calif.
Dow Chemical Co., Midland, Mich.
duPont, E. I. de Nemours & Co. (Inc.), Wilmington, Del.
General Chemical Co., 40 Rector St., New York City.
Goulard & Olena, Inc., 140 Liberty St., New York City.
Insecticide Corp. of America, Medina, N. Y.
Interstate Chemical Mfg. Co., 35 No. 6th St., Reading, Pa.
Lavanburg, Fred L. Co., 90 John St., New York City.
Lirio, P. E., Vineland, N. J.
Los Angeles Chemical Co., 1960 Santa Fe Ave., Los Angeles, Calif.
Lucas Kil-Tone Co., 322 Race St., Philadelphia, Pa.
Mechling Bros. Chemicals, Div. of General Chemical Co., 12 So. 12th St., Philadelphia, Pa.
Niagara Sprayer & Chemical Co., Inc., Middleport, N. Y.
Peaslee-Gaulbert Corp., 407 West Main St., Louisville, Ky.
Robins, G. S. Co., 310 South Commercial St., St. Louis, Mo.
Rosenthal, H. H. Co., 25 East 26th St., New York City.
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Society for Visual Education Inc., East Ohio St., Chicago, Ill.
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PHOTOGRAPHS OF INSECTS

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American Assoc. of Econ. Entomologist, New Brunswick, N. J.
American Public Health Assoc., 1790 Broadway, New York, N. Y.
Carnegie Institute, Washington, D. C.
Commonwealth Fund, 41 E. 57th St., New York, N. Y.
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Gorham Press, Boston, Mass.
Macmillan Co., New York, N. Y.
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National Malaria Society, Box 997, Tallahassee, Fla.
Science Press Printing Co., Lancaster, Pa.
Thomas, C. C., Baltimore, Md.
U. S. Department of Agriculture, Washington, D. C.
U. S. Public Health Service, Washington, D. C.

PUMPS, CONSTRUUCTION AND HAND

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Blackmer Rotary Pump Co., Grand Rapids, Mich.
Briggs-Statton Corp., Milwaukee, Wisc.
Fitzhenry-Guptill Co., 135 First St., E. Cambridge, Mass.
Gould Pumps, Seneca Falls, New York.
Homelite Corp., Riverdale Ave., Port Chester, N. Y.
Jaeger Machine Co., Columbus, Ohio.
Johnson & Dealaman, Inc., 225 South St., Newark, N. J.
LeRoi Company, Milwaukee, Wisc.
Trench Marine Pump Co., Inc., 126 W. 22nd St., New York, N. Y.
Worthington Pump & Machine Corp., Harrison, N. J.

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Allaire, Woodward & Co., Peoria, Ill.
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Hammond Paint & Chemical Co., Beacon, N. Y.
J. L. Hopkins & Co., 220 Broadway, New York City.
McCormick Sales Co., Inc., 490 Light St., Baltimore, Md.
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Penick, S. B. & Co., 132 Nassau St., New York City.
Powell, John & Co., Inc., 114 East 32nd St., New York City.
Prentiss, R. J. & Co., Inc., 80 John St., New York City.
Sunland Sulphur Co., P. O. Box 964, Fresno, Calif.

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Allan & Co., Inc., St. Louis, Mo.
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Betard Chemical Co., 20 Thompson Ave., Glens Falls, N. Y.
Bohlender Plant Chemicals, Inc., Tippecanoe City, Ohio.
Brilliant Search Light Mfg. Co., Chicago, Ill.
Burma-Vita Co., Minneapolis, Minn.
Burroughs, Wellcome & Co., Inc., New York, N. Y.
Case, F. P. Co., Sault Sainte Marie, Mich.
Cenol Company, Chicago, Ill.
Frierson Drug Co., Charleston, S. C.
Fly Terror Mfg. Regd., Quebec, P. Q.
Hubere Cosmetics, Chicago, Ill.
Huntington Laboratories, Inc., Huntington, Ind.
Jenkins, H. C. & Co., Los Angeles, Calif.
Kessler Chemical Co., Inc., Delaware Ave., Philadelphia, Pa.
Kimball Bros. & Co., Enosburg Falls, Vermont.
Knickerbocker, Holland, Michigan.
Kurung, Joseph M., Ray Brook, N. Y.
Macy, R. C. Co., New York, N. Y.
Magnus, Mabee & Reynard, Inc., New York, N. Y.
McCormick Laboratories, Kalamazoo, Mich.
McKesson & Robbins, Inc., New York, N. Y.
Midwest Oil Co., Minneapolis, Minn.
Millsite, Howell, Michigan.
Morrocks-Ibbotson Co., Utica, N. Y.
National Carbon Co., Inc., Chicago, Ill.
Oil of India Co., Chicago, Ill.
Penslar, The Co., Inc., Detroit, Mich.

Pfeiffer, S. Mfg. Co., St. Louis, Mo.
Phillips & Benjamin Co., Waterbury, Conn.
Potter & Moore, Lavender House, London, England.
Rohm & Hass, 930 Halstead St., Chicago, Ill.
Sears, Roebuck and Co., Philadelphia, Pa.
Shakespeare Co., Kalamazoo, Mich.
Sharples Solvent Corp., 80 Jackson Blvd., Chicago, Ill.
Skol Chemical Co., Inc., New York, N. Y.
Snap Fly Dope Co., Springfield, Mass.
Socony-Vacuum Oil Co., Van Buren St., Chicago, Ill.
Solo Chemical Works, Inc., New York, N. Y.
Stanco, Inc., Bayway, N. J.
Stott, H. R., 3211 Woodland Ave., Philadelphia, Pa.
Strong Cobb & Co., Inc., Cleveland, Ohio.
Sunshine Products, Brooklyn, N. Y.
Swastika Drug Co., Ltd., Swastika, Ont.
Tanglefoot Co., Grand Rapids, Mich.
U. S. Industrial Chemicals, Inc., 60 E. 42nd St., New York, N. Y.
United Drug Co., Boston, Mass.
Velsicol Corp., 3542 N. Kimball Ave., Chicago, Ill.
Walgreen Co., Chicago, Ill.
Wilson, Andrew, Inc., Springfield, N. J.
Wisconsin Pharmacal Co., Milwaukee, Wisc.
Zon, Inc., New York, N. Y.

RUBBER SUPPLIES

Acme Rubber Mfg. Co., 90 W. Broadway, New York, N. Y.
Atlantic Mfg. Co., Wilmington, Del.
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Cambridge Rubber Co., 748 Main St., Cambridge, Mass.
Diamond Rubber Co., Inc., Akron, Ohio.
Goodrich, B. F., Akron, Ohio.
Goodall Rubber Co., 7 South 36th St., Philadelphia, Pa.
Goodyear Footwear Co., 44 Warren St., Providence, R. I.
Goodyear Rubber Co., 85 Chambers St., New York, N. Y.
Goodyear Rubber Products Corp., 144 Mulberry St., Newark, N. J.
Hood Rubber Co., Inc., Watertown, Mass.
Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind.
Pioneer Rubber Mills, San Francisco, Calif.
Servus Rubber Co., 328 Broadway, New York, N. Y.
Snyder, M. L. & Son, Jasper St., Philadelphia, Pa.
U. S. Rubber Co., 1230 Sixth Ave., New York, N. Y.

SECOND-HAND BOOK DEALERS

Barnes & Noble, Fifth Ave., New York, N. Y.
Charter Rock, Livingston, N. J.
Fiedler, Henry George, 31-33 E. 10th St., New York City.
Nature Publishing Co., 1558 Park Ave., Indianapolis, Ind.
Schmidt, G., 415 Woodland Ave., Leonia, N. J.
Sherman, John D., Jr., 132 Primrose Ave., Mount Vernon, N. Y.
Stechert, G. E. & Co., 31-33 East 10th St., New York City.

SPRAYERS, HAND AND POWER

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SEACOAST LABORATORIES, INC., 156 PERRY ST., N. Y., N. Y.
SMITH, D. B. & CO., UTICA, NEW YORK.
Acmeline, Inc., Traverse City, Mich.

Aggeler & Musser Seed Co., 652 Matteo St., Los Angeles, Calif.
Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.
Cambell & Budling, San Jose, Calif.
Deming Co., Salem, Ohio.
DeVilbiss Co., Toledo, Ohio.
Dobbins Mfg. Co., No. St. Paul, Minn.
Friend Mfg. Co., Gasport, N. Y.
Frost Insecticide Co., Arlington, Mass.
Fumeral Co., Racine, Wisc.
Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill.
Jaeckh Mfg. Co., 3444 Colerain Ave., Cincinnati, Ohio.
Lirio, P. E., Vineland, N. J.
Los Angeles Chemical Co., 1960 Santa Fe Ave., Los Angeles, Calif.
Lowell Sprayer Co., Lowell, Mich.
Milwaukee Sprayer Mfg. Co., 2437 W. Fond du Lac Ave., Milwaukee, Wis.
Peterson, Arthur D. Co., 420 Lexington Ave., New York, N. Y.
Oakes Mfg. Co., The, Tipton, Ind.
Roediger, Paul O., Princeton, N. J.
Universal Metal Products Co., Lowell, Mich.
Volume Sprayer Mfg. Co., Tulsa, Okla.
Wilson, Andrew, Inc., Springfield, N. J.

TANKS, OIL STORAGE

Briggs Boiler Works Co., Akron, Ohio.
Boyle Mfg. Co., 5100 Santa Fe Ave., Los Angeles, Calif.
Caldwell, W. E. Co., Inc., Louisville, Ky.
Columbia Steel Tank Co., Kansas City, Mo.
Hamler Boiler & Tank Co., Chicago, Ill.
Quaker City Tank Co., Philadelphia, Pa.

TOOLS, HAND

American Fork & Hoe, 1623 Euclid Ave., Cleveland, Ohio.
Ames-Baldwin-Wyoming Co., Parkersburg, W. Va.
Ames, Oliver & Sons, North Easton, Mass.
Bridgeport Hardware Mfg. Corp., Bridgeport, Conn.
Clark & Barlow Hardware Co., 123 W. Lake St., Chicago, Ill.
Collins Co., Collinsville, Conn.
Consolidated Wagon & Machine Co., Salt Lake City, Utah.
Council Tool Co., Wananish, Wisc.
Emerson & Stevens Mfg. Co., Oakland, Maine.
Federal Hardware, 447 Greenwich St., New York, N. Y.
Geyer Mfg. Co., Rock Falls, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hamlin Metal Products Co., 58 W. Exchange, Akron, Ohio.
Hawkins Equipment Co., 1475 Thomas St., Memphis, Tenn.
Hays Supply Co., Memphis, Tenn.
Hibbard, Spencer, Bartlett, Chicago, Ill.
King Axe & Tool Co., Oakland, Maine.
Magor Car Corp., 50 Church St., New York, N. Y.
Mann Edge Tool Co., Oakland, Maine.
Nicholson File Co., Providence, R. I.
Peavey Mfg. Co., Brewer, Maine.
Peck Stow & Wilcox Co., Southington, Conn.
Plumb Fayette, R., Inc., Philadelphia, Pa.
Riechman Crosby Co., 223 Front St., Memphis, Tenn.
Rixford Mfg. Co., Highgate, Vermont.
Salt Lake Hardware & Machine Co., Salt Lake City, Utah.
Sears, Roebuck and Co., Philadelphia, Pa.
Snow & Nealley Co., Bangor, Maine.

Stanley Works, New Britain, Conn.
Underhill Clinch & Co., 84 White St., New York, N. Y.
Vaughan & Bushnell Mfg. Co., Chicago, Ill.
Walker-Turner Co., Plainfield, N. J.
Warren Axe & Tool, Warren, Pa.

TRAPS, MOSQUITO

HAUSSHER MACHINE WORKS, BAYVILLE, N. J.
Lincoln Mfg. Co., New Brunswick, N. J.

UNDERWATER WEED CUTTERS

Hockney, C. L., Silver Lake, Wisc.

BIOGRAPHY

(Continued from Page Four)

Santee-Cooper project for the South Carolina Public Service Authority at Charleston.

Dr. Williams has been active in international malaria problems for a number of years. In 1923, he went to Europe as a member of a special committee of the League of Nations to study the malarious sections of Italy. In 1929, he represented the Public Health Service on the League of Nations interchange to India, where he had opportunities for seeing new and varied phases of the malaria problem. In April 1938, he was sent to San Juan, Puerto Rico, to conduct a survey of the sanitation and medical care problems in the Island.

He was sent as an official delegate of the Public Health Service to the Third Joint International Congress for Tropical Medicine and Malaria, meeting Amsterdam, Netherlands, from September 24 to October 1, 1938. While in Europe, he spent some time on malaria investigations in London, England.

From November 1939 to June 1940, Dr. Williams headed a Commission to assist the Chinese in the investigation of malaria problems, particularly on the Burma-China border. The Chinese Government reported that the Commission's excellent work resulted in marked improvement in the organization and technique of malaria control in the Southwestern provinces of China. On his return to the United States, Dr. Williams reported to the Service on the epidemic diseases existing in China.

In November 1940, Dr. Williams was detailed as liaison officer to the U. S. Army Fourth Corps Area with headquarters in Atlanta, Georgia. In this capacity, he promoted general health and sanitation measures in extra-military areas. He was appointed to the rank of Medical Director on April 8, 1941.

Relieved from the post of liaison officer in April 1942, he was detailed to establish and administer an Office of Malaria Control in War Areas, with headquarters in Atlanta. This office works with the several State health departments to control production of malaria mosquitoes and reduce potential malaria transmission in extra-cantonment zones of military and essential war industrial areas.

At the request of the Secretary of War, Dr. William was assigned to the Medical Corps of the Army on July 9, 1943 to serve as Chief Malariologist of the North African and Mediterranean theatres of operation. Shortly after his arrival in North Africa, he suffered an attack of coronary disease and was hospitalized. Back in this country, he now is recuperating.

Dr. Williams served on the Committee on Medicine and Public Health of the Section of Tropical Diseases, New York World's Fair in 1939. He is a member of the Malaria Committee of the American Association for the Advancement of Science, the Sub-committee on Malaria of the Health Section of the League of Nations, and the Malaria Commission of the Pan American Sanitary Bureau.

He is the author of many papers on malaria control and other phases of public health.

PROGRAM OF JOINT MEETINGS
of the
AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS
AND ENTOMOLOGICAL SOCIETY OF AMERICA
Columbus, Ohio, December 7-9, 1943

MEDICAL ENTOMOLOGY IN WARTIME
December 7, 1 P. M. and Continued December 8, 9:30 A. M.

F. C. Bishopp, Bureau of Entomology and Plant Quarantine, U.S.D.A.
Discussion Leader

Relation of Insects to the Health of Military Personnel
Maj. O. R. McCoy, Office of the Surgeon General, War Department

Entomologists and the Sanitary Corps
Col. W. A. Hardenburgh, Office of Sanitary Engineers
War Dept. (Not Present)

Insect Control at Army Training Camps in the United States
Maj. Stanley J. Carpenter, Army Sanitary Corps

Problems of Medical Entomology of Military Importance in Canada
Maj. R. H. Ozburn, Royal Canadian Army Medical Corps

Mosquito Problems in the American Tropics
W. H. Komp, United States Public Health Service
(Not Present; paper not given)

Chemical Control of Insects that Affect Man's Health and Comfort
Fumigation
Randall Latta, U.S.D.A., Bureau of Entomology and Plant Quarantine
10 Minutes

Repellents, contact insecticides and larvicides
E. F. Knipling, U.S.D.A., Bureau of Entomology and Plant Quarantine
and
T. C. Allen, University of Wisconsin 20 Minutes

Aerosols
L. D. Goodhue, U.S.D.A., Bureau of Entomology and Plant Quarantine
10 Minutes

(Not Listed)
Col. Freeborn, U.S.P.H.S.
Malaria Control by U.S.P.H.S. in War Areas of U. S.

Col. Bradley, U.S.P.H.S.
Entomological Activities by U.S.P.H.S. in War Areas

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